TUESDAY, 12:30-13:00

Title: Soil Structure: Measurements and Morphology

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Soil structure controls important physical and biological processes in soil-plant-microbial systems. Those processes are dominated by the geometry of soil pore structure and a correct model of this geometry is critical for understanding them. Soil tomography has been shown to provide rich three-dimensional digital information on soil pore geometry. Indirect methods are often used to determine, for instance, the distribution of pores sizes as a part of assessing geometry of soil pore structure. But this approach has serious shortcomings. In the last few decades soil tomography has emerged as a brand new technology that provides a direct methodology to use three-dimensional information to quantify geometrical features of soil pore space. New tools, both in the realm of image acquisition of soil structure and numerical simulation of processes on complex geometrical structures like lattice Boltzmann methods have opened new avenues to this old standing problem. It has being suggested that these techniques would provide a better understanding of the linkage between structure and flow and transport processes in natural soils and in this way they would improve the predictability of this models in the vadose zone. We will show how geometrical mathematical techniques may facilitate and guide the process from image acquisition to geometrical measurement of soil structure. The effectiveness of these tools will be tested by their success on the discrimination soil structures that are a priory different.